100

```
┌─────────────────────┐
│   Input Device /    │◄──────────────────────┐
│ Acoustic Front-End  │                       │
│        102          │                       │
└─────────────────────┘                       │
           │                    ┌─────────────▼──────────────────────┐
           ▼                    │  Memory - 105                      │
┌─────────────────────┐         │  ┌──────────────────────────────┐  │
│      Speech         │         │  │  Unified Model - 107         │  │
│    Recognition      │◄────┐   │  │  ┌────────────────────────┐  │  │
│  Engine / Module    │     │   │  │  │                        │  │  │
│        104          │     │   │  │  │   Language             │  │  │
└─────────────────────┘     │───┼─►│  │   Models               │  │  │
           │                │   │  │  │                        │  │  │
           ▼                │   │  │  │        106             │  │  │
┌─────────────────────┐     │   │  │  └────────────────────────┘  │  │
│    Confidence       │     │   │  │  ┌────────────────────────┐  │  │
│   Measurement       │◄────┘   │  │  │   Semantic             │  │  │
│        112          │         │  │  │   Language             │  │  │
└─────────────────────┘         │  │  │   Model                │  │  │
           │                    │  │  │                        │  │  │
           ▼                    │  │  │        108             │  │  │
┌─────────────────────┐         │  │  └────────────────────────┘  │  │
│    Recognized       │         │  └──────────────────────────────┘  │
│  Speech / Output    │         │  ┌──────────────────────────────┐  │
│        114          │         │  │  Other Programs and/or       │  │
└─────────────────────┘         │  │  Databases including         │  │
                                │  │  vocabularies, dictionaries  │  │
                                │  │  and models                  │  │
                                │  │        110                   │  │
                                │  └──────────────────────────────┘  │
                                └────────────────────────────────────┘
```
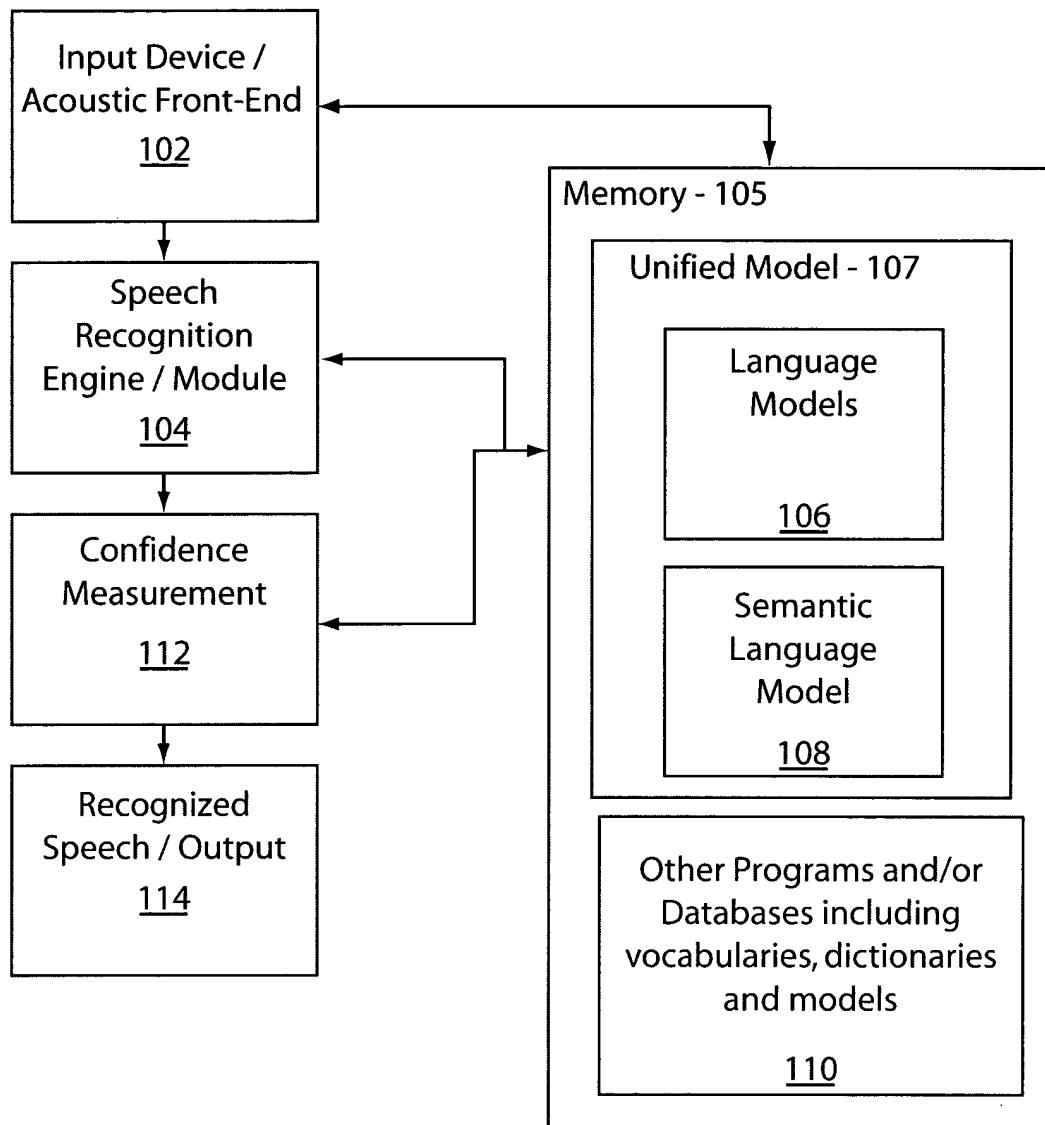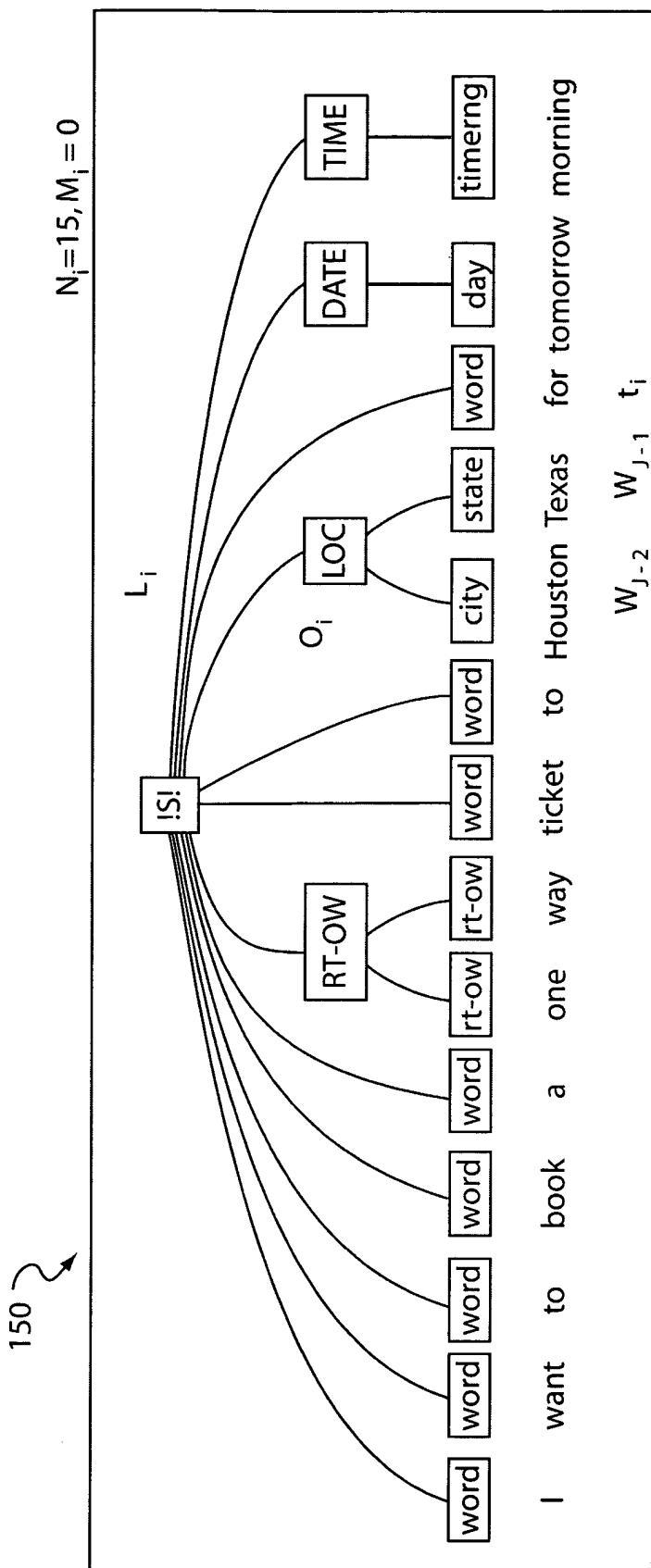
FIG. 1

FIG.2

[!S! i want to book a [RT-OW one way RT-OW] ticket to [LOC Houston Texas LOC] for [DATE tomorrow DATE] [TIME morning TIME]!S!]
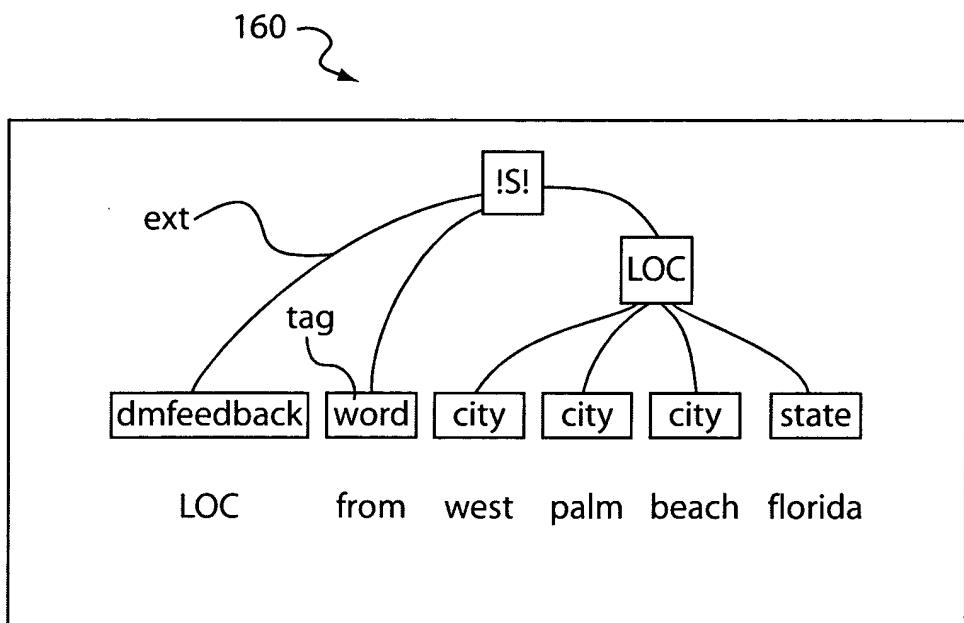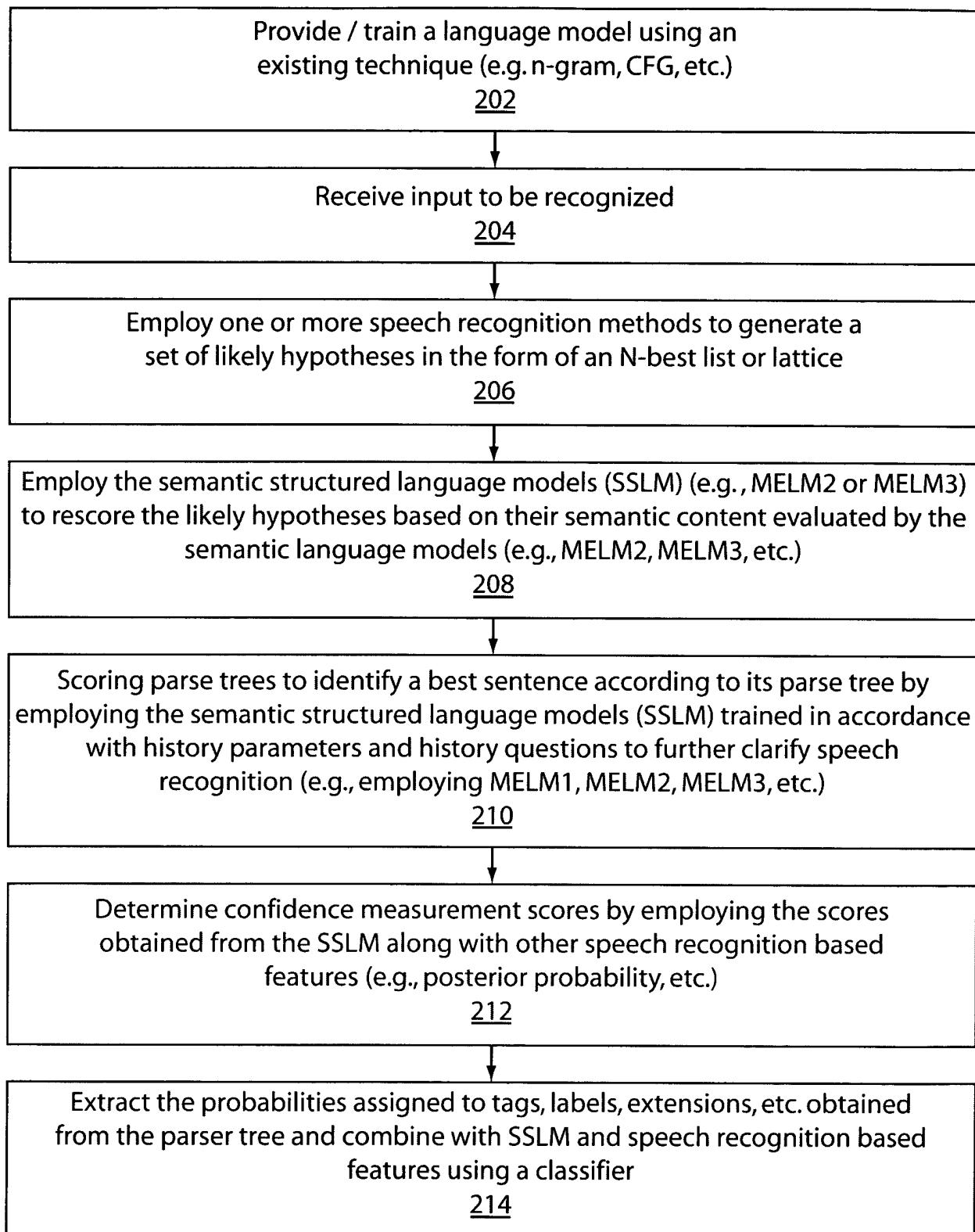
160

FIG. 3

Provide / train a language model using an
existing technique (e.g. n-gram, CFG, etc.)
202

Receive input to be recognized
204

Employ one or more speech recognition methods to generate a
set of likely hypotheses in the form of an N-best list or lattice
206

Employ the semantic structured language models (SSLM) (e.g., MELM2 or MELM3)
to rescore the likely hypotheses based on their semantic content evaluated by the
semantic language models (e.g., MELM2, MELM3, etc.)
208

Scoring parse trees to identify a best sentence according to its parse tree by
employing the semantic structured language models (SSLM) trained in accordance
with history parameters and history questions to further clarify speech
recognition (e.g., employing MELM1, MELM2, MELM3, etc.)
210

Determine confidence measurement scores by employing the scores
obtained from the SSLM along with other speech recognition based
features (e.g., posterior probability, etc.)
212

Extract the probabilities assigned to tags, labels, extensions, etc. obtained
from the parser tree and combine with SSLM and speech recognition based
features using a classifier
214

FIG. 4